



TITLE:

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(Special Papers in Honor of late
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CITATION:

WEINER, Wanda Maria ...[et al]. New North Korean species of *Psyllaphorura* Bagnall, 1948 (Collembola, Onychiuridae) (Special Papers in Honor of late Professor Ryozo Yoshii). Contributions from the Biological Laboratory, Kyoto University 2000, 29(2): 133-137

ISSUE DATE:

2000-03-31

URL:

<http://hdl.handle.net/2433/156118>

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New North Korean species of *Psyllaphorura* Bagnall, 1948 (Collembola, Onychiuridae)

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ABSTRACT A new species of *Psyllaphorura* from North Korea is described and a key to the species of this genus is given.

KEY WORDS Collembola / *Psyllaphorura* / new species / North Korea.

Introduction

The present paper, a fifth one in the series of studies on the Onychiurinae of North Korea (Weiner, 1986, 1989, 1994, Weiner & Szeptycki, 1997), describes a new *Psyllaphorura* species.

The division of Onychiurinae into several genera rather than postulating just one genus *Onychiurus* Gervais, 1841, without or with a few subgenera, is supported by solid evidence and finds more and more advocates (Fjellberg 1998, Jordana *et al.* 1997, Pomorski 1996, 1998, Weiner, 1996).

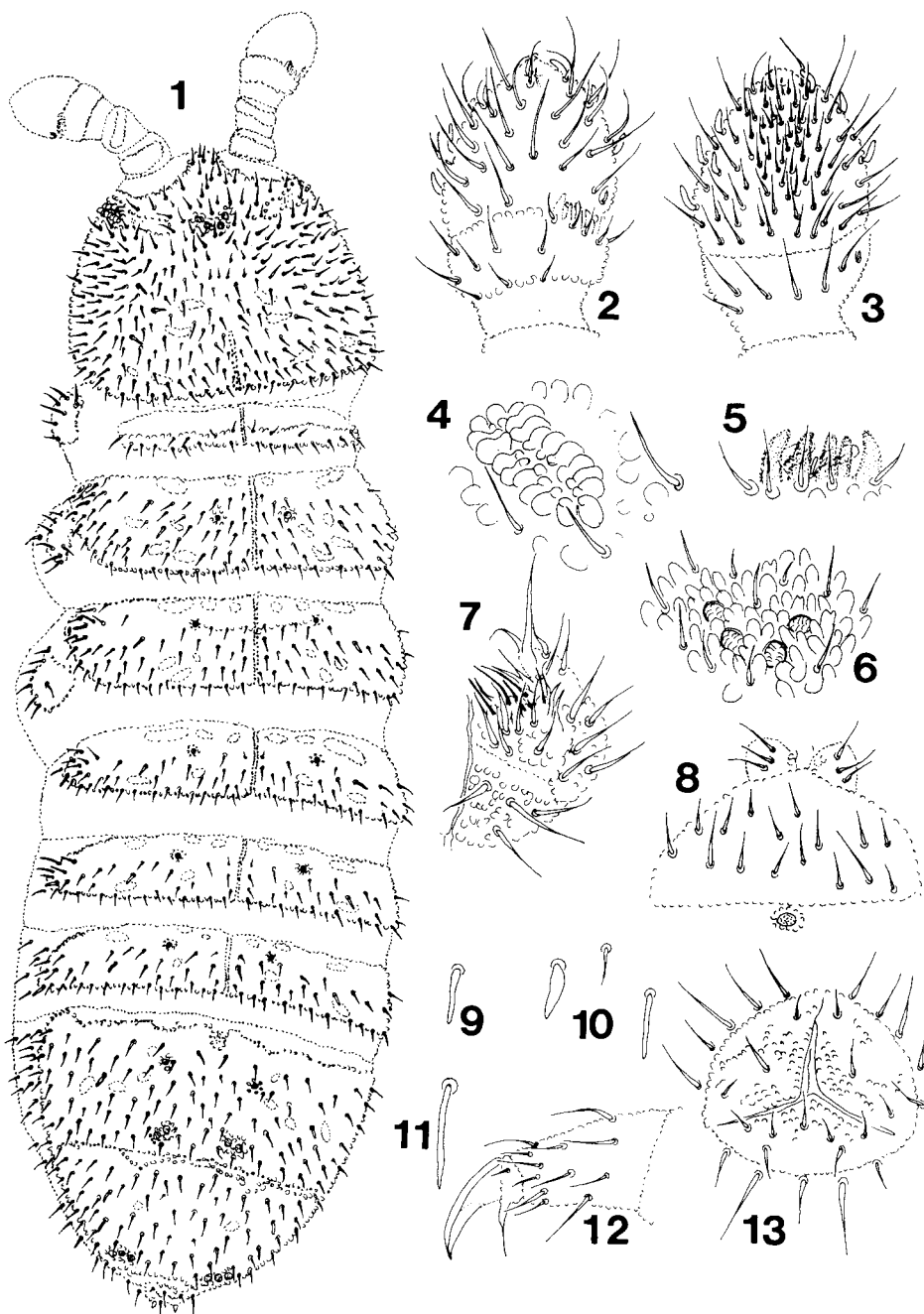
The genus *Psyllaphorura* was created by Bagnall (1948) for a North American species, but the species described later are distributed mostly in the Urals (Khanislamova 1986), Siberia (Stebaeva 1985, Weiner & Stebaeva in press) and the Far East (Martynova 1981, Yosii 1954, 1956, 1967).

Our study is based on material collected during the 1987 expedition to North Korea by members of the Institute of Systematics and Evolution of Animals, Polish Academy of Sciences, Kraków, Poland.

ABBREVIATIONS: ISEA, Institute of Systematics and Evolution of Animals, Polish Academy of Sciences, Kraków, Poland; MNHN, Laboratoire d'Entomologie, Muséum national d'Histoire naturelle, Paris, France.

Psyllaphorura ryzoyoshii sp. n. Figs. 1-13

Habitus typical of the genus *Psyllaphorura* Bagnall, 1948; abdomen VI very short dorsally, dorsal side of body coarsely granulated with tubercles larger than setae-basis. Antennae club-shaped, apical vesicle absent. Antennal segment IV with 10 distinct



Figs. 1-13. *Psyllaphorura ryozoyoshii* sp. n.: 1, dorsal chaetotaxy; 2, antennal segment III and IV (dorsally); 3, antennal segment III (ventrally); 4, postantennal organ; 5, sensory organ of antennal segment III; 6, antennifer pseudocelli; 7, labium; 8, furca; 9, mesochaeta of thoracic tergum II, 10, sensory setae, microchaeta and mesochaeta of abdominal tergum V; 11, mesochaeta of abdominal tergum VI; 12, tibiotarsus III with claw; 13, anal valves.

short and thick sensilla. Postantennal organ with 18-20 simple vesicles, enlarged at the bases. Pseudocellar formula per half tergite: 20/000/00023; 2+2 pseudocelli on head, placed closely together in antennofrontal part of head. Labium of AC-type after Fjellberg (1998/1999). Tibiotarsi with 23, 23 and 22 setae, seta M present.

Holotype (adult male) length 1.25mm, paratypes: female length 1.27mm, juvenile male 0.91mm and juvenile 0.87mm. Body plump, cylindrical. Colour in alcohol white. Dorsal side of body with strong granulation (Figs. 1, 6). Usually 7-9 grains around each pseudocellus, diameter of grains larger than diameter of setae-bases. Bases of antennae very well marked (Fig. 1).

Antennae of the same length as head. Antennal segment I with 10 setae, antennal segment II with 14 setae. Sensory organ of antennal segment III consisting of 5 guard setae, 5 papillae, two smooth sensory rods, two ovoid, curved, smooth sensory clubs with two ribs and small lateroexternal sensillum (Fig. 5). Antennal segment IV with 10 well distinguished short sensilla, with small subapical organite in cavity on top of segment and one latero-external microsensillum in basal part of segment, ventral side with small apical protuberance (Figs. 2, 3).

Postantennal organ with 18-20 simple vesicles, enlarged at bases and at apex, perpendicular to long axis of organ (Fig. 4). Labrum with 4/342 setae. Labium as in Fig. 7. Labial palp with sensilla A and C thickened and blunt at top (type AC), with hypostomal seta H, guard setae a1, b2, d3-4, e1-3.

Pseudocellar formula per half tergite 20/000/00023, ventral and subcoxal pseudocelli absent. 2+2 pseudocelli on head placed closely together in antennofrontal part of head (Figs. 1, 6). Parapseudocelli not visible. Pseudopores present on thoracic terga II-III (1+1), abdominal terga I-IV (1+1), ventral part of antennal bases (2+2), thoracic sterna (1+1), abdominal sterna II-IV (one odd pseudopore) and on all coxae.

Dorsal chaetotaxy as in Fig. 1, with numerous mesochaetae blunt at tip (always with some asymmetry), single, acuminate microchaetae and thick sensory setae s (Figs. 9-11). Sensillar formula per half tergum: 3/022/222221 (on abdominal segment IV lateral sensory setae s on pleura, on abdominal segment VI sensory setae s on pleura, as being placed on abdominal segment V). Thorax II-III with lateral microsensilla (ms). Seta d0 on head absent. Thoracic sterna without setae. Ventral tube with 8+8 setae.

Male ventral organ absent. Furca (Fig. 8): dens in the form of two papillae with 3 setae each, mucro absent, tenaculum with 1+1 teeth. Three rows of manubrial setae present. Abdominal tergum VI very short with two rows of setae, setae a0 and p0 present. Anal spines short and thick (1/4 of the length of claw's inner edge) on very short papillae (almost the same length as anal spines). Abdominal sternum VI very large (larger than abdominal sternum IV). Each even valve with 1-1-1/5 setae (a0, a1, c0, c1, c2); odd valve with 1-1-1, 1-0-1/5 setae (a0, a1, a2, b1, c0, c1 and c2) (Fig. 13).

Tibiotarsi I, II and III with 23, 23, 22 setae respectively; setae A1-4, T1-4, B1-5, B7, M, C1-3, C7 present, seta C7 absent on tibiotarsus III. Claw without tooth. Empodial appendage without basal lamella; apical filament reaching 3/4 the length of inner edge of claw (Fig. 13).

Holotype: male (K-87-9/1). **Paratypes:** female (K-87-9/2), juvenile male (K-87-9/3) in ISEA and juvenile (K-87-8) in MNHN. North Korea: Chagang Province, Myongmun Pass (Kekoge) (50 km from Huichon) 40° 23' N 127° 21' E, 17-v-1987; 1000 m a.s.l. rich deciduous forest on granite rocks, litter mainly with maple and oak leaves, lower layer, lgt. J. Pawtowski (K-87-9); 750 m a.s.l., deciduous forest mainly with maples, lower layer of litter, lgt. A. Szeptycki (K-87-8).

Remarks: The new species has the same number of pseudocelli (20/000/00023) as three other species: *Psyllaphorura okafujii* (Yosii, 1967), *Psyllaphorura sensillifera* (Martynova, 1981) and *Psyllaphorura uenoi* (Yosii, 1954). It differs from them by the presence of pseudocelli on head placed closely together in antennofrontal part of head rather than near to antennal bases and postantennal organ. Each of the four species has a different number of vesicles in postantennal organ (20-25 in *P. okafujii*, 24-26 in *P. sensillifera*, 15-18 in *P. uenoi* and 18-20 in the new species).

Etymology: The new species is dedicated to the memory of Professor Ryozyo Yoshii, the great Japanese specialist in Collembola, Grand Master of our collembologist community. He put the foundations for modern chaetotaxy of Collembola, which have been helping us in our taxonomic works.

Key to the species of *Psyllaphorura* Bagnall, 1948

1. Thoracic terga II and III without pseudocelli 2
 Thoracic tergum II with 1 + 1 pseudocelli, thoracic tergum III with 1 + 1
 or without pseudocelli, head with 3 pseudocelli near antennal basis
 *P. obesa* (Mills, 1934), USA (caves in Iowa)
2. Sensory organ of antennal segment III with five guard papillae 3
 Sensory organ of antennal segment III with four guard papillae, pseudocellar
 formula per half tergum: 20/000/00013, pseudocelli on head on border of
 antennal base *P. martynovae* (Stebaeva, 1985), Russia (Kuznetskii Altai)
3. Head with 2 + 2 pseudocelli, dens with three setae each 4
 Head with five pseudocelli, dens with two setae each
 *P. bashkirica* (Khanislamova, 1986), Russia (Bashkiria)
4. Pseudocelli on head placed near to the antennal bases 5
 Pseudocelli on head placed together in antennofrontal part, 18-20 vesicles
 in postantennal organ
 *P. ryozyoyoshii* sp. n., North Korea (Changang Province)
5. Sensory setae s distinct especially on abdominal tergum V 6
 Sensory setae s indistinct, 15-18 vesicles in postantennal organ
 *P. uenoi* (Yosii, 1954), Japan (caves in Nara, Mié, Siga, Hiroshima,
 Yamaguchi, Ehime and Hukuoka Districts)
6. Postantennal organ with 20-25 vesicles, claw elongated, apical filament of
 empodial appendage reaching 1/2 the length of inner edge of claw
 *P. okafujii* (Yosii, 1967), Japan (Yamaguchi District)

Postantennal organ with 24-26 vesicles, claw not elongated, apical filament of empodial appendage longer than inner edge of claw

..... *P. sensillifera* (Martynova, 1981), Russia (Primorskii Krai)

Acknowledgements

We are most grateful to Jerzy Pawtowski and Andrzej Szeptycki, who made the material described here available to us.

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